Rhode Island.—2d.

South Carolina.—Spartanburg, 3d, 4th, 27th, 28th, 30th, 31st; Pacolet, 3d, 28th to 29th, 30th; Statesburg, 28th, 29th, 30th.

Tennessee.—Milan, 2d, 3d, 4th, 16th, 28th to 30th; Memphis, 2d, 3d, 27th to 31st; Nashville, 2d, 16th, 22d, 28th, 30th, 31st; Chattanooga, 28th to 31st; Knoxville, 30th, 31st.

Texas.—Cleburne, 1st, 27th; Silver Falls, 16th; Fort Elliott, 26th, 27th; Corsicana, 27th; Palestine, 27th, 28th, 29th.

Utah.—11th, 12th, 13th, 19th, 20th, 23d, 24th, 25th.

Vermont.—2d to 9th, 16th, 17th, 19th, 20th, 22d, 24th.

Virginia.—1st to 6th, 17th, 22d, 23d, 27th, 29th, 30th.

Washington Territory.—9th to 12th, 20th to 26th, 29th, 31st.

West Virginia.—1st to 5th, 16th, 17th, 19th, 22d, 23d, 30th, 31st.

Wisconsin.—1st to 5th, 15th to 21st, 26th to 31st.

Wyoming.—26th.

ICE.

The formation of ice in the southern parts of the country occurred on the following dates:

Arkansas.—Lead Hill, 28th, 31st.

California.—Salinas, 31st.

Kansas.—Manhattan, 1st, 27th; Salina, 25th.

Maryland.—Fallston, 17th.

Missouri.—Oregon, 1st.

North Carolina.—Reidsville, 2d.

Texas.—Silver Falls, 1st.

TEMPERATURE OF WATER.

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; the average depth at which the observations were made; and the mean temperature of the air:

Temperature of water for October, 1886.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Max.	Min.			
	°	°	°		°
Alpena, Michigan	57.1	45.3	11.8	11.7	48.1
Augusta, Georgia	77.0	59.5	17.5	5.7	61.7
Baltimore, Maryland	71.5	59.6	11.9	11.5	58.6
Block Island, Rhode Island	62.7	55.0	7.7	8.9	54.8
Boston, Massachusetts	56.1	49.2	6.9	23.5	51.5
Buffalo, New York	61.9	52.5	9.4	13.9	52.0
Canby Fort, Washington Territory	57.9	50.6	7.3	14.2	52.4
Cedar Keys, Florida	80.8	67.7	13.1	7.6	71.2
Charleston, South Carolina	79.4	64.9	14.5	37.6	66.5
Chicago, Illinois	60.4	47.3	13.1	8.4	56.6
Chincoteague, Virginia	73.6	58.0	15.6	3.9	61.0
Cleveland, Ohio	66.8	52.8	14.0	13.5	53.9
Detroit, Michigan	61.5	48.7	12.8	27.7	54.8
Duluth, Minnesota	48.7	42.1	6.6	10.5	46.9
Escanaba, Michigan	53.6	49.0	4.6	18.9	48.2
Galveston, Texas	77.3	65.6	11.7	15.2	71.6
Grand Haven, Michigan	63.0	48.7	14.3	18.4	52.3
Jacksonville, Florida	83.7	68.0	15.7	18.0	68.9
Key West, Florida	84.7	74.7	10.0	18.7	78.3
Mackinaw City, Michigan	56.8	49.0	7.8	10.0	50.3
Macon, Fort, North Carolina	78.3	65.6	12.7	14.2	64.8
Marquette, Michigan	57.7	47.1	10.0	12.0	50.3
Mobile, Alabama	80.0	69.0	11.0	17.1	64.7
New London, Connecticut	64.6	56.3	8.3	12.8	53.4
New York City	68.8	57.2	11.6	15.1	56.5
Norfolk, Virginia	73.7	60.3	13.4	16.6	61.3
Pensacola, Florida	76.3	66.2	10.1	17.9	69.0
Portland, Maine	55.9	47.5	8.4	17.5	47.9
Portland, Oregon	60.8	47.9	12.9	48.8	51.4
Sandusky, Ohio	63.0	49.1	13.9	10.3	54.0
Sandy Hook, New Jersey*	68.2	58.0	10.2	13.3	57.4
San Francisco, California	58.3	55.9	2.4	38.8	57.1
Savannah, Georgia	78.7	63.1	15.6	17.0	60.2
Smithville, North Carolina	79.2	65.0	14.2	10.4	63.5
Toledo, Ohio	65.2	48.7	16.5	12.9	53.4
Wilmington, North Carolina†					

* Record for first 21 days of month. † Observations temporarily suspended.

PRECIPITATION.

[*Expressed in inches and hundredths.*]

The distribution of rainfall over the United States and Canada for October, 1886, as determined from the reports of about seven hundred stations, is exhibited on chart iii.

Owing to the unusually small amount of precipitation during the month, a shading to represent from one to two inches is used; usually, areas of less than two inches of precipitation are not shaded.

The precipitation of the month is largely below the normal in nearly every district of the United States, the only exceptions being the northern and middle portions of the Rocky Mountain region, the middle Pacific coast, northern Texas, and the western portion of the Indian Territory; in these districts the rainfall of the month is considerably above the normal. In Arizona and along the southern Pacific coast it is about normal, or only slightly above. Although the whole of the Mississippi Valley and all the country lying to the eastward is largely below the normal the greatest departures occur in the south Atlantic states, Gulf States, and Ohio Valley; within this large area one station only, Sanford, Florida, reports an excess of rainfall. The normal rainfall of the south Atlantic states for October, as deduced from the Signal Service observations of the past thirteen years, is 4.30, while the average for these states during October, 1886, is only .69, less than one-sixth of the normal; in the eastern Gulf states the deficiency is even greater; the normal for these states is 3.30, while the average of the Signal Service records of the present month within this area is only .36, about one-ninth of the normal quantity. The only stations east of the one-hundredth meridian at which an excess of rain fell are, Dubuque, Iowa, excess .95; Mackinaw City, Michigan, .22; Portland, Maine, 3.09; New York City, .58; Sandy Hook, New Jersey, 3.30; Atlantic City, New Jersey, 5.34; Sanford, Florida, 2.46.

The following are some of the most marked departures from the normal precipitation at Signal Service stations:

Above normal.	Inches.	Below normal.	Inches.
Atlantic City, New Jersey	5.34	Hatteras, North Carolina	6.01
Fort Sill, Indian Territory	4.73	Charleston, South Carolina	4.89
Sandy Hook, New Jersey	3.30	Brownsville, Texas	4.50
Portland, Maine	3.09	Smithville, North Carolina	4.29
Sanford, Florida	2.46	Springfield, Illinois	3.80
Winnemucca, Nevada	1.17	Pensacola, Florida	3.76
Yuma, Arizona	1.07	Jacksonville, Florida	3.76
Dubuque, Iowa	0.95	Wilmington, North Carolina	3.61
Fort Thomas, Arizona	0.82	Galveston, Texas	3.58
Fort Custer, Montana	0.75	Mobile, Alabama	3.53

In the following table are shown, for the several geographical districts, the normal precipitation for October; the average for October, 1886, and the excess or deficiency as compared with the normal:

Average precipitation for October.

Districts.	Average for Oct., Signal-Service observations.		Comparison of Oct., 1886, with the average for several years.
	For several years.	For 1886.	
	Inches.	Inches.	Inches.
New England	4.23	3.88	— 0.35
Middle Atlantic States	3.25	2.78	— 0.47
South Atlantic States	4.30	0.69	— 3.61
Florida Peninsula	5.42	4.27	— 1.15
Eastern Gulf States	3.30	0.36	— 2.94
Western Gulf States	3.73	1.44	— 2.29
Rio Grande Valley	3.71	0.34	— 3.37
Tennessee	3.35	0.81	— 2.54
Ohio Valley	3.20	0.88	— 2.32
Lower lake region	3.37	1.52	— 1.85
Upper lake region	3.56	2.23	— 1.33
Extreme northwest	1.85	1.46	— 0.39
Upper Mississippi Valley	3.38	1.70	— 1.68
Missouri Valley	2.58	1.18	— 1.40
Northern slope	1.09	0.84	— 0.25
Middle slope	1.44	1.11	— 0.33
Southern slope	2.26	3.90	+ 1.64
Southern plateau	0.76	0.77	+ 0.01
Middle plateau	1.13	1.85	+ 1.72
North Pacific coast region	4.19	3.48	— 0.71
Middle Pacific coast region	1.14	1.31	+ 0.17
South Pacific coast region	0.36	0.39	+ 0.03

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows, for certain stations, as reported by voluntary observers, the average precipitation for the month